

Appn. No 10/758,427

Attorney Docket No. 10541-1829

II. Remarks

Reconsideration and re-examination of this application in view of the above amendments and the following remarks is respectfully requested.

Claims 1 through 7 stand rejected. Claim 1 is being amended. Claims 2 and 3 are being cancelled. Accordingly, after entering this amendment, claims 1 and 4-7 remain pending.

As amended, claims 1 is directed to a hydraulic coupling system with a clutch assembly, a pump, a valve, and a controller. The clutch assembly includes an actuator and a multi-disk clutch pack coupled to the actuator. The pump pressurizes a fluid in the actuator to engage the clutch pack and pumps the fluid through the clutch pack to cool the clutch pack. The valve maintains the fluid pumped to the actuator at a higher pressure than the pressure of the fluid pumped through the clutch pack to cool the clutch. The controller transmits *pulse-width modulated control signals to the pump* to control the operation of the pump and *pulse-width modulated control signals to the valve* to control the operation of the valve.

Among other advantages, the pulse-width modulated signal to the valve regulates the pressure in the system, and the pulse-width modulated signal to the pump maintains the output of the pump at an optimum level. Thus, the pump does not run continuously at 100% output when such output is not needed. (See, e.g., paragraph 36.) For instance, when the clutch pack is disengaged, the pulse-width modulated signal from the controller instructs the pump to reduce the output flow from the pump, and when the clutch pack is to be engaged for pull



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power, the pulse-width modulated signal instructs the pump to operate at or near 100%. The pulse-width modulated signal to the pump, therefore, regulates the electrical energy usage of the system and also reduces wear of the pump since the pump does not operate at 100% all of the time.

Specification

The specification has been amended to add the reference characters 106 and 112 (Figs. 6A-6C), 508 (Fig. 12), 620 (Fig. 13), and 822 (Fig. 15). In addition, the specification has been amended to correct certain informalities. Now new matter is being added.

Claim Rejections - 35 U.S.C. §103 (a)

Claims 1-3 and 7 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,518,098 to Zanetel et al. (Zanetel) in view of U.S. Patent No. 6,578,654 to Porter (Porter). Claims 4-6 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Zanetel in view of Porter and further in view of U.S. Patent Application No. 2003/0089573A1 to Ackermann (Ackermann).

Zanetel discusses, as shown, for example, in Figures 2, 3, or 4, a hydraulic coupling system with a master clutch (25) and a pump (13) that pressurizes a fluid to engage the master clutch (25) and pumps fluid through a lubrication supply line (36) to the master clutch (25) to cool the clutch assembly. A restrictor (37) in the supply line (36) lowers the pressure of the fluid in the line,

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and a clutch lube control spool (38) controls the rate of delivery of the fluid to the master clutch (25). Zanetel does not show a controller or a multi-disk clutch, both of which are recited in amended claim 1.

Porter discusses, as shown, for example, in Figures 6 or 8, a controller (68) that sends control signals to actuate a clutch (76) and pulse-width modulated signals to a valve (72). Porter, however, does not teach or suggest a controller that sends pulse-width modulated control signals to the pump (78). Moreover, Porter does not appreciate the advantages of controlling the operation of the pump to regulate the electrical energy usage of the system and to reduce wear of the pump. Absent an appreciation of these advantages, there is no suggestion of a controller that transmits pulse-width modulated signals to the pump.

Thus, Porter fails to disclose or suggest the features lacking in Zanetel, namely, a controller which transmits pulse-width modulated control signals to a pump to control the operation of the pump, as recited in amended claim 1. It must be concluded, therefore, that the combination of Zanetel in view of Porter cannot render claim 1 of the present application as obvious.

As for Ackermann, that reference merely describes an accumulator in a hydraulic clutch actuation system and, therefore, does not cure the deficiencies of Zanetel or Porter.

Accordingly, reconsideration of the rejections under 35 U.S.C. § 102(a) and the allowance of claim 1 are respectfully requested. Further, since claims 4



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through 7 depend from claim 1, the reasons for allowance of claim 1 apply as well to the dependent claims.

Conclusion

In view of the above amendments and remarks, it is respectfully submitted that the present form of the claims (claims 1 and 4-7) are patentably distinguishable over the art of record and that this application is now in condition for allowance. Such action is respectfully requested.

Respectfully submitted by,

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